

Advanced High Temperature Structural Honeycomb TPS, Phase I

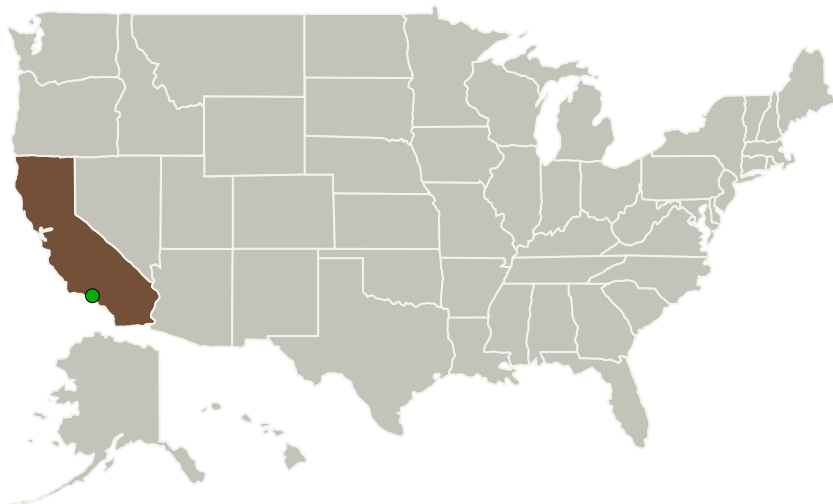
Completed Technology Project (2012 - 2012)



Project Introduction

In this NASA Phase I SBIR program, MATECH proposes to leverage successfully developed laboratory and pilot scale manufacturing technologies to produce low cost Silicon Oxycarbide (SiOC) fibrous-walled high temperature honeycomb structures, hat stiffeners, and rigid fibrous insulators. A highly scale-able melt blowing fiber manufacturing system was previously developed to produce non-woven mat from preceramic polymer and then formed into a pleated shape using a pleating apparatus. MATECH has shown that the SiOC fibrous ceramic used to make the core retains its mechanical and thermal stability to temperatures up to 1400°C. These robust structural airframe materials can be densified with SiOC and ZrOC (for ultra-high temperature) matrix materials to produce a suite of advanced heat shield components. This suite innovative airframe material systems and fabrication methodology offers robust innovative multifunctional structural high temperature thermal protection systems for demanding high-mass planetary entry, descent, and landing (EDL) applications. The active support and participation of Pratt & Whitney Rocketdyne and Boeing bodes well for a successful Phase I effort and follow-on Phase II program. More significantly, the close collaboration with these major industrial stakeholders enhances the likelihood of a successful Phase III transition into commercialization.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
MATECH Advanced Materials	Lead Organization	Industry	Westlake Village, California
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California

Project Transitions

▶ **February 2012:** Project Start

✓ **August 2012:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137961>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MATECH Advanced Materials

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

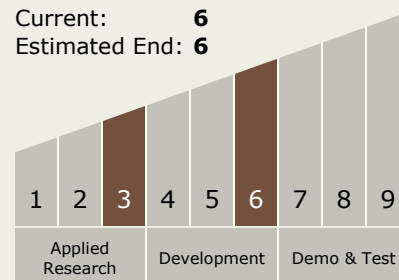
Carlos Torrez

Principal Investigator:

Thomas Rosengren

Technology Maturity (TRL)

Start: 3
Current: 6
Estimated End: 6



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.1 Aeroassist and Atmospheric Entry
 - └ TX09.1.1 Thermal Protection Systems

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System